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ABSTRACT

This guide contains information and lesson plans for use in teaching students the importance of developing and maintaining a healthy diet. The lessons are primarily for use in fourth-grade classrooms, but portions of the lessons are appropriate for more advanced age groups. Each lesson plan is accompanied by worksheets and activities planned to help students better understand the importance of including wheat foods in their diet. Included are lesson plans and answer keys on: (1) The Wheat Plant; (2) Digestion and Wheat Nutrients; (3) Where's the Wheat: How To Read Food Labels; (4) Eating for Life: the U.S. Department of Agriculture Food Guide Pyramid and Dietary Guidelines; and (5) Cooking with Wheat. Some lesson plans also include resources for further information, recipes, and instructions for crafts projects using bread dough. (MAH)

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Wheat For You

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Designed as an internship project for the Idaho Wheat Commission
by Maxine Harrold

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Dear Educator:

The lessons in this packet were developed through an internship project by the Idaho Wheat Commission and designed primarily for use in 4th grade classrooms. However, portions of the lessons are appropriate for advanced age groups.

The information in each lesson is given to provide the teacher with a thorough understanding of the various topics you may elect to teach, and to determine the material most appropriate for your individual class. It is suggested that you review the handbook and its contents thoroughly before beginning the program.

Each lesson plan is accompanied by a variety of worksheets and activities designed to help students better understand the importance of including wheat foods in their diets. Included are lesson plans on the following:

1. The Wheat Plant
2. Digestion and Wheat Nutrients
3. Where's the Wheat - how to read food labels
4. Eating For Life - the USDA Food Guide Pyramid and Dietary Guidelines
5. Cooking with Wheat

In 1990 the U.S. Department of Agriculture revised their Dietary Guidelines which recommended that American's eat 6 - 11 servings of grain products daily. They later released the Food Guide Pyramid to help visualize this message. However, a Gallup poll conducted by the Wheat Foods Council found that only 5 percent of Americans are meeting those guidelines.

Eating habits are developed at an early age. Thus, it is our desire to assist educators in teaching their students the importance of developing and maintaining a healthy diet.

We trust this information will be helpful to you.

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LESSON 1:

"The Wheat Plant"

The student will:

1.1 Learn facts, both ancient and recent, about wheat.
"All About Wheat."

1.2 Identify parts of the wheat plant and kernel.
"The Wheat Plant and Kernel." *Worksheets 1A and 1B.*

1.3 Grow wheat from seeds.
"Let's Grow a Wheat Plant!"

Notes to teacher:

1. Make a transparency of *Worksheet 1A*, "The Wheat Plant and Wheat Kernel." Discuss the differences between the parts of the wheat kernel and wheat plant. Give the students a worksheet and let them fill in the parts of the wheat plant and kernel.
2. Discuss *Worksheet 1B*, "Which Part of the Kernel?" with students and allow them to complete it.
3. "Let's Grow A Wheat Plant" is a hands-on activity which allows the students to grow wheat in the class. This is a fun project but takes at least three months for the plant to fully develop. You may suggest the project be done at home.

Resources:

1. *Wheat For Kids* is a booklet available from the Idaho Wheat Commission. It explains how wheat is planted, harvested and milled into flour. Activities for kids are included.
2. *Eat Wheat* is a booklet available from the Idaho Wheat Commission. Through games, puzzles and recipes, children learn facts about Idaho's wheat industry.

LESSON 1.1

ALL ABOUT WHEAT

Sometime between 10,000 and 8,000 B.C. primitive man discovered that stored grain seeds would last all through the winter, and then the following spring they could be planted. It is believed that this was the reason man was able to stop roaming for food and settle down in one place and farm for his own food.

Farming started in an area that today makes up the countries called Lebanon and Iraq. Grain was the basic food crop grown way back then and still is the basic food for today.

In 1993, Idaho produced about 3,000,000 metric tons (110 million bushels) of wheat, which would make 8 billion 1-pound loaves of bread. This means that every person in Idaho would have to eat 768 loaves of bread during the year to eat it all. Can you estimate how many railroad cars it would take to carry all that wheat? Over 33,000!

Seventy-five percent of Idaho's wheat is *soft white* wheat. This type of wheat is milled into cake and pastry flour which is used to make cakes, cookies, crackers, flat bread, quick breads, cereals and oriental noodles.

The three major grains are wheat, corn, and rice. Grains are important for two reasons. First, grains provide a very healthy and versatile food source. Second, grains are used for animal feed.

HEY GUESS WHAT?

- Bread was the first food to be made, rather than gathered.
- Early bread was flat, heavy and dry (something like Mexican tortillas)
- The bread that people eat most today is baked from fermented dough which contains bubbles of carbon dioxide, a gas. The bubbles expand when the dough is heated, and the bread rises and becomes light and airy.
- Archaeologists have found a piece of bread over 4,000 years old. It was preserved in an ancient village in Switzerland.
- Ancient Egyptians first roasted wheat and barley over open fires.

LESSON 1.2

THE WHEAT PLANT & KERNEL

The wheat kernel, sometimes called the wheat berry, is the seed from which the wheat plant grows. Each tiny seed contains three distinct parts that are separated during the milling process to produce flour. The kernel of wheat is a storehouse of nutrients essential to the human diet.

ENDOSPERM -

This is the large white part of the kernel that nourishes the young growing plant. The *endosperm* makes up 83 percent of the wheat kernel and is used to make white flour. The *endosperm* contains the greatest share of protein, carbohydrates and iron, as well as the major B-vitamins, such as riboflavin, niacin, and thiamine. *Endosperm* is the primary source of starch and also a source of fiber.

BRAN -

This is the hard outer covering of the kernel. It makes up about 14-1/2 percent of the kernel's weight. *Bran* is included in whole wheat flour and can also be purchased separately. *Bran* contains a small amount of protein, large quantities of the three major B-vitamins, trace minerals, and dietary fiber.

GERM -

When a seed is planted, this part grows into a new plant. It contains about 2-1/2 percent of the kernel's weight. It can be ground to make whole wheat flour or purchased separately. The *germ* is often separated from flour in milling because the fat content limits the flour's shelf-life. The *germ* contains small quantities of high quality protein and a greater share of B-complex vitamins and trace minerals.

WHEAT FACT 1:

Wheat is green until late July or early August. Then it changes to a golden yellow color. Can you picture "amber waves of grain" from the song "America the Beautiful?"

WHEAT FACT 2:

The head of a wheat plant can have a "beard" or be "beardless." The beard consists of toothpick-like projections that stick out from each kernel of wheat.

LESSON 1.3

LET'S GROW A WHEAT PLANT!

Now that we know the parts of a wheat plant let's grow some wheat kernels and see what they look like.

MATERIALS YOU WILL NEED:

A few wheat kernels (preferably *spring* wheat)
Paper cup
Potting soil
Plant pot (5 X 5 or large enough to prevent the plant from tipping over.)

STEP 1: Soak kernels of wheat in three times their volume of water in a paper cup until they are saturated, preferably overnight. Drain off the water that hasn't been absorbed.

STEP 2: Prepare a plant pot with the potting soil by packing dirt into the pot. Dig a small hole in the soil and put one of the soaked seeds in. Cover it with dirt. Repeat process, keeping 3-inches between seeds.

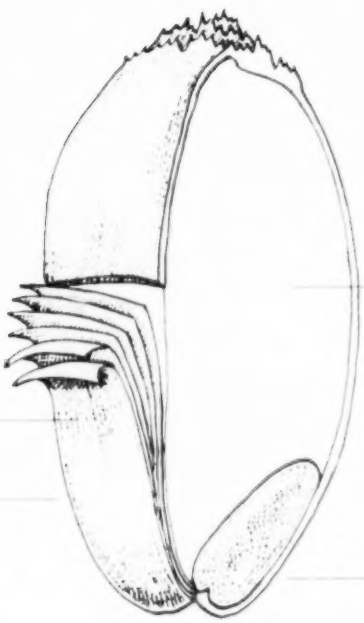
Wheat plants will grow to about 3 feet tall, so only plant one or two in a pot so it won't turn over when it gets taller.

WORKSHEET 1A

NAME_____

THE WHEAT PLANT AND WHEAT KERNEL

(also known as the wheat berry)



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WORKSHEET 1B

NAME_____

WHICH PART OF THE KERNEL?

Fill in the blanks with the correct answer. Choose the answers from these three words:

Bran **Endosperm** **Germ**

1. _____ I am the largest part of the kernel.
2. _____ I am the hard outer covering of the kernel.
3. _____ We are used to make wheat flour.

_____

_____

4. _____ I only make up 2-1/2% of the kernel.
5. _____ I am used to make white flour.
6. _____ I am made of many thin layers.
7. _____ I make up 83% of the kernel.
8. _____ I grow into a new plant.
9. _____ I am 14-1/2% of the kernel.
10. _____ I am the smallest part of the kernel.
11. _____ I nourish the young plant when it starts to grow.
12. _____ I am the part you touch, when you hold the kernel of wheat.

Adapted from *Nebraska's Ag in the Classroom Program*

LESSON 2:

"Digestion and Wheat Nutrients"

The student will:

2.1 Identify the parts of the digestive system.
"How Does Digestion Work?" *Worksheet 2A.*

2.2 Define nutrients and explain why they are important.
"What Are Nutrients?"

2.3 Learn why vitamins, minerals and water are important
"Vitamins, Minerals & Water." *Worksheet 2B.*

2.4 Learn the differences between white and wheat bread.
"What's So Good About Wheat?"

Notes to the teacher:

1. Make a transparency of the diagram of "The Digestive System" *Worksheet 2A.* Hand out the blank picture and have students fill in the names of the digestive organs. Encourage students to color the picture of the digestive system.

2. Information about digestion, carbohydrates, protein, fat, vitamins, mineral, and water are given to help you understand the role of digestion. You may want to teach some of the information to students. *Worksheet 2B,* "Nutrition of Breads."

3. Obtain nutrition labels for white, wheat, and whole wheat bread to explain the differences found in bread. Compare bread labels.

LESSON 2.1

HOW DOES DIGESTION WORK?

Digestion actually begins before you put food in your mouth. Just think about eating a chocolate chip cookie or the smell of a pie baking in the oven. Does your mouth start to fill with liquid? Well, if it does, that liquid in your mouth is called saliva and that is the beginning of digestion.

MOUTH -

After taking a bite of food, a flood of saliva is released from the walls of your *mouth.* Saliva is composed of chemicals called enzymes. These enzymes, along with chewing, begin to break down the food into nutrients. That is the whole purpose of digestion — to break down foods into nutrients that can be used by the body.

ESOPHAGUS -

Once the food in your mouth becomes mushy from chewing, it slides down the *esophagus* and empties into the stomach.

STOMACH -

Your *stomach* is like a balloon and can stretch very large. It holds almost 2 quarts of food — that's a lot of mushed-up bread slices! Digestive juices begin to flow out of the *stomach* walls, just like in your mouth, to digest the food into millions of small pieces. After about 3 or 4 hours, the mushy food becomes like soup. During this process some nutrients from your food are absorbed into the *stomach* wall and into the bloodstream.

SMALL INTESTINE -

Actually, the *small intestine* is not small. If it were stretched out, it would be 21 feet long. But in your body it is like a coiled up garden hose. Muscles twist and turn to push the mushy soup through the *small intestine.* Here most of the nutrients in the food you ate are absorbed through the wall of the *small intestine* into the bloodstream.

LARGE INTESTINE -

The *large intestine* isn't really large - it's only 5 feet long, but it is about 2-1/2 inches wide and that's how the *large intestine* got its name. Any nutrients or water not absorbed through the small intestine will be absorbed through the *large intestine* and into the bloodstream. The remaining particles will then be pushed out of the body.

LESSON 2.2

WHAT ARE NUTRIENTS?

Nutrients promote growth and help repair the body. Once nutrients are absorbed into the bloodstream they are carried all over the body through your blood vessels, which go from the tip of your toes to the top of your head.

Foods contain a variety of nutrients. There are three calorie-containing nutrients common to all foods. They are carbohydrates, proteins, and fats. Foods also contain vitamins, minerals, and water. Let's take a look to see how our bodies use these nutrients.

CARBOHYDRATES: THE POWERHOUSE OF ENERGY

When you think of carbohydrates what do you think of? If you are thinking of bread, spaghetti or baked potatoes, you are right. All of these foods contain carbohydrates. But what about celery or an orange or table sugar? These foods are also made with carbohydrates. In fact, there are three kinds of carbohydrates:

SUGARS are known as *simple carbohydrates* because they are quickly broken down by the body and ready to be used. They are found in foods such as fruits, milk, and table sugar.

STARCHES are one of the two *complex carbohydrates* from plants. All starches are plant material. Cereal grains, such as wheat, barley, corn, rice and oats are excellent sources of starch. Starches are also found in potatoes and beans. Many people think starchy foods such as potatoes, bread, and pasta are fattening. It's what you put on them that is usually fattening, not the food itself.

FIBER, another *complex carbohydrate*, is found in the walls of plant cells. It is the tough structural parts of plants such as the stringy part of celery or the bran from wheat. Fiber can be either soluble or insoluble. Both types of fiber can be found in the same food, but the amounts vary from one plant to another.

Soluble fiber is digested to produce calories, just as sugars and starches. *Insoluble fiber*, on the other hand, does not provide calories and cannot be digested by the body. Fiber helps to move food along in the small and large intestines and then helps to carry waste outside of your body.

Of the three carbohydrates, starch is the most commonly eaten, but it is important to get your fiber too.

Carbohydrates provide energy for your body. In fact, they're your main source of energy. When you eat foods with carbohydrates, such as bread, your body breaks down the starch and sugars into glucose. Glucose is the fuel for your cells, just like gas is the fuel for a car. Without glucose your body won't run very well. (Did you know that glucose keeps your brain going so you can think?)

FAT: A NECESSARY EVIL

Do you know what fat is, or what food you find it in? Some foods are obvious such as fried foods or bacon. But many times fat can be in products that you would never imagine — peanut butter, olives, granola, sunflower seeds, candy bars and many others. That is why it is important to look at the ingredients label on food packages to find out how much fat is in the food you eat. Usually, fat added to foods gives it the yummy flavor that we grow up loving to eat.

There are two sources of fat in our diets. One is from animal products, such as meat and dairy products. And the other is from plant sources, such as oils, avocados, coconuts, or nuts.

SATURATED FAT - This source of fat can be from a plant or animal source. These are foods such as meat, egg yolk, avocado, coconut, palm oil, peanut butter, margarine or imitation dairy products.

UNSATURATED FAT - This source of fat is only found in plants. They are oils such as olive, canola and peanut oils. (These three are the best kind of oils you can eat.)

Fat is a concentrated source of energy. Fat is stored in the cells of your body and looks like pale cheddar cheese when you tear a piece off.

Fat has more than twice as many calories (per gram) than any other food. Fat is different than carbohydrates because once fat is eaten, it is not used directly for energy but it is stored throughout your body until a time when it is needed, and can be broken down by your cells and used by your body. Eating too much fat adds calories and, well...it makes you gain extra weight.

Health experts suggest choosing foods made with unsaturated fat from plant sources more often than foods made with saturated fats because they have found that eating too much fat can cause heart attacks, strokes, high blood pressure, or other diseases.

But, there is a good side to fat too! Fat insulates the body from extreme temperatures, insulates internal organs from shock, and carries fat soluble vitamins. Also, fat is needed for the production of hormones which are like a crew boss that tells the organs of your body how to work. It also is needed for proper nerve functions which will send messages to your brain, like pulling your hand off a hot pan before you get burned.

Glucose is burned by cells in your body. It doesn't produce a flame, but it produces energy and gives off heat. And that is why your body temperature stays at a constant 98.6°F.

Cells use the energy along with other vitamins and minerals to repair

themselves, make new cells, and keep your body working right.

Whenever you eat more carbohydrates than your body needs there are two things that will happen. First, the glucose is changed into glycogen and stored in your muscles or liver so your body can quickly change it back to glucose if you need extra energy — like when you are running from a dog or chasing your brother or sister. Second, the glucose that is not changed into glycogen, is changed into fat. This fat can be stored anywhere in your body. If you need it later, fat can be changed back into glucose to be used as energy.

PROTEIN: BUILDING BLOCK TO GOOD HEALTH

Protein is found everywhere in your body. It's in your skin, muscles, kidneys, liver, nails, hair, brain, bones, everywhere!!! Protein helps your body repair itself and to grow. It even helps you fight off diseases and infections. And it also produces energy just like carbohydrates and fat.

Proteins are made up of different amino acids grouped together. There are over twenty different amino acids, and each time two or more amino acids group together they make a different kind of protein. Your body needs many different kinds of proteins and that's why it's important to eat a variety of foods with protein.

Mr. Muscle — Although protein makes muscles, you won't get more muscles by eating more protein. Muscles increase in size by exercising. Eating extra protein results in the protein being stored as fat — the same fate as an extra carbohydrate.

CALORIES: ENERGY IN MOTION

Calories are found in all foods. A calorie is a measure of energy provided by the carbohydrate, protein, or fat in the food you eat. They also measure the amount of energy you use to live and grow. The ideal situation is to eat the same amount of calories as your body needs in a day.

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LESSON 2.3

VITAMINS, MINERALS & WATER

VITAMINS

Vitamins are very small and necessary elements found in food which do not produce calories. Vitamins are necessary to help the body break down the energy producing nutrients and each one has a special use in your metabolic activities. There are two kinds:

WATER SOLUBLE - These vitamins are easily absorbed in your body and if there is an excess, they will be flushed out of your system. Often these vitamins are lost from foods by over-cooking. This group contains the B-vitamins such as thiamin, niacin, riboflavin, pyridoxine, and cobalamin, and vitamin C. Grain foods are a good source of B-vitamins.

FAT SOLUBLE - As the name implies, these vitamins can only be absorbed when there is fat around. You don't have to eat fat soluble vitamins everyday because any excess vitamins you received from your food today, will be stored in your body fat and liver to be used tomorrow. These vitamins are A, D, E, and K.

MINERALS

Minerals are small, chemical elements such as, calcium, iron, zinc, and potassium which are needed in small amounts by your body. They are essential for healthy bones and teeth, and are necessary for all your cells and body fluids. They also help to regulate you body processes and fluid balance. Minerals are found in many foods, but not all minerals are found in every food, so you have to eat a variety of food. Foods made from wheat contain zinc, magnesium and are a great source of iron.

WATER

Water is essential for life. You can survive weeks without food but you can only live a few days without water. Water is found in every cell of your body. Water makes about 60 percent of an adult's body weight and even more for a child's. Your blood is 90 percent water, and your brain is 75 percent.

Every day your body loses about 2-1/2 quarts of water. Some is lost in urine. Some is lost in perspiration — when you run on the play ground, and some is lost when you breathe. (That's why windows get foggy when you breathe on them!)

Replacing the water you lose is not hard. Nearly all foods have water. Can you think of some foods with a lot of water? Watermelon, strawberries, and tomatoes are only a few. What about milk! There is water in milk and even in meats.

LESSON 2.4

WHAT IS SO GOOD ABOUT WHEAT?

The importance of wheat in our diet was identified in the early 1940's when diseases such as pellagra, beriberi and anemia were widespread in the United States. Doctors studied the diets of those people who had these diseases and found that their diets lacked B-vitamins (thiamine, niacin, and riboflavin) and iron. The doctors worked hard to figure out a way to increase the B-vitamins and iron in the American diet and came up with a great idea! Because almost everybody eats bread, they would add these important vitamins and iron to flour that would then be made into bread and other wheat-based products. So, that is how doctors solved the problem of missing nutrients, and made products made with wheat flour more nutritious.

Wheat foods are naturally low in calories and fat:

Many people believe that bread and other wheat foods are high in calories and are fattening. Not true!! Actually, most of the calories and fat are from the spreads and toppings you put on your bread, cereal and pasta.

The differences between white, wheat and whole wheat bread:

Look at the nutrition labels of white, wheat, and whole wheat breads and compare their nutrition and ingredient labels. You will notice that there are differences in each kind of bread. There are even differences between brands of bread.

White bread is usually made from enriched white flour (wheat kernel endosperm). Wheat bread may be made from: 1) whole wheat flour (the entire wheat kernel); 2) whole wheat flour mixed with white flour; 3) white flour with caramel coloring, or many other ways. Whole wheat bread is made from the whole wheat flour (the entire wheat kernel). There are no rules that define what has to be in the bread if it has a specific label. The best thing to do is read your labels.

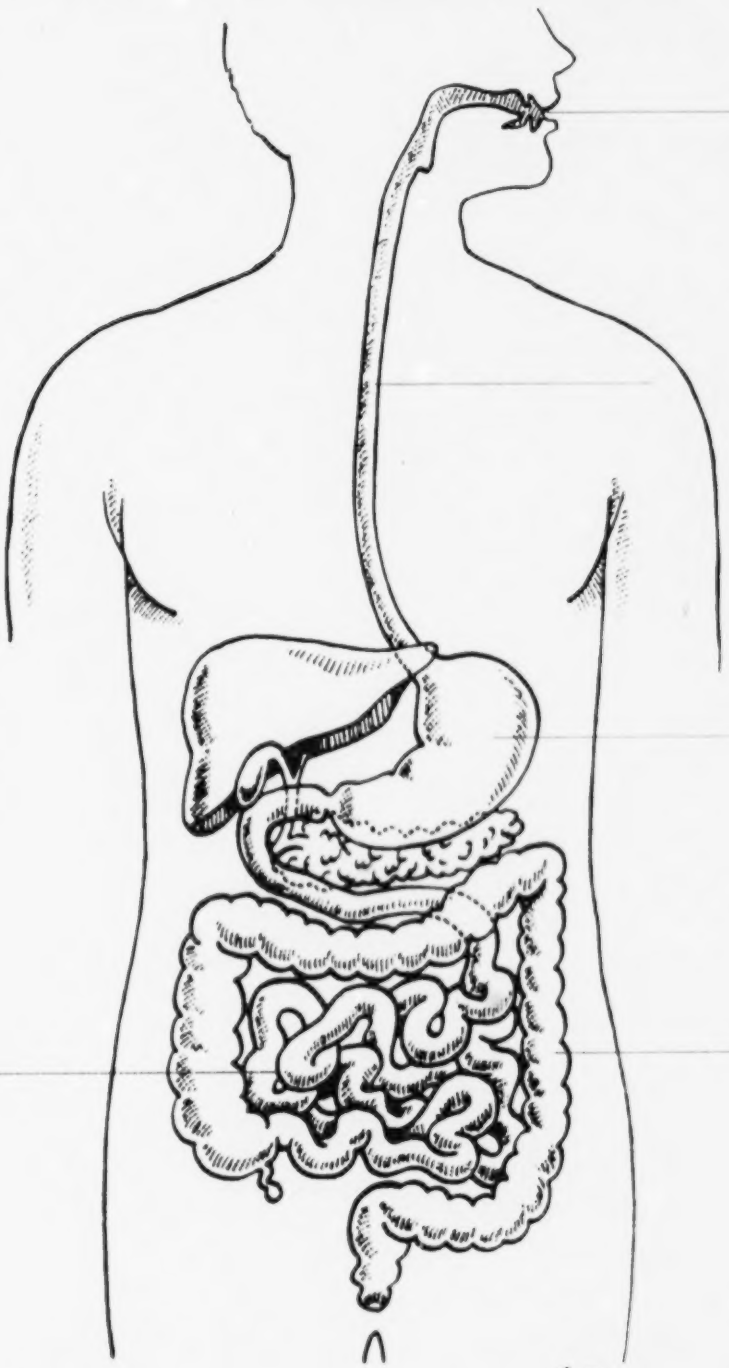
Bread made from whole wheat flour will increase the amount of fiber in the bread. No matter which bread you choose, they all have basically the same amount of nutrients. But, watch-out for those breads that have added goodies such as sunflower seeds, because those can add calories and fat.

Just remember to read your nutrition and ingredient labels.

WORKSHEET 2A

NAME_____

THE DIGESTIVE SYSTEM



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WORKSHEET 2B

NAME_____

NUTRITION OF BREADS

Carbohydrate

Wheat provides lots of carbohydrates. This is what gives your brain the energy to think and your body the energy to sprint to the finish line.

Iron

Wheat has iron needed for your red blood cells.

Fiber

Fiber helps move your food through your intestines.

Protein

Wheat has protein that helps you grow.

Thiamin, Niacin & Riboflavin

(the B-vitamins)

Together the B-vitamins help your body burn energy so you can play.

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LESSON 3:

"Where's The Wheat?"

The student will:

3.1 Explain terms on nutrition labels.
"How to Read Nutrition Labels." *Worksheet 3A.*

3.2 List food products that contain wheat (flour).
Worksheet 3B, Worksheet 3C, Worksheet 3D and *Worksheet 3E.*

Notes to teacher:

1. Ask students to bring in a variety of food packages the day you will be explaining food nutrition labels. Have students look at various labels, noting foods that contain grains and specifically wheat or flour. A cereal label is shown on *Worksheet 3A.* Have your class compare the nutrition information on the worksheet to other nutrition labels. (This page can be copied on to a transparency.)

2. Assign *Worksheet 3B,* "You Are What You Eat." Students are required to read food nutrition labels at home and complete the worksheet.

3. Assign *Worksheet 3C,* "Wheat Scavenger Hunt." Have students look through the food in their house or at the grocery store to discover which contain wheat or flour.

   * This can be used as a team competition.

3. Give students *Worksheet 3D,* "Foods With Wheat Don't Have to Be Puzzling" and *Worksheet 3E,* "What's in a Name" to complete.

LESSON 3.1

HOW TO READ NUTRITION LABELS

Food labels are a good tool for making healthy nutrition choices. Most packaged foods have two types of labels (although they are usually combined to look like just one label.)

STANDARD INGREDIENT LABELS list the ingredients used to make the food product in descending order by weight. That means the ingredients are listed in order, from the most to the least and by how much they weigh. For instance, if sugar is listed first, then there is more sugar (by weight) in that food product than any other ingredient. However, if sugar is listed last, then there is a very small amount of sugar in that food item. The labels can be a little tricky though. Some cereals claim they contain "no sugar" but may list honey as the second ingredient. And some labels will contain a type of syrup, as well. (Aren't they all simple sugars?)

NUTRITION LABELS list the calories, grams of carbohydrate, fat, protein and percentages of the U.S. Recommended Dietary Allowances of 12 basic nutrients. This label will tell you how much of the "good stuff" you're getting in the foods you are eating.

WORKSHEET 3A

NAME_____

WHAT'S HEALTHY AND WHAT'S NOT?

Nutrition Facts

Serving Size 3/4 cup (30g)
Servings Per Container: 18

Amount Per Serving	Apple Cinnamon Cheerios	with 1/2 cup Skim Milk
Calories	120	160
Calories from Fat	25	25
		% Daily Value**
Total Fat 2.5g*	4%	4%
Saturated Fat 0g	0%	3%
Cholesterol 0mg	0%	1%
Sodium 180mg	8%	19%
Potassium 70mg	2%	8%
Total Carbohydrate 24g	8%	10%
Dietary Fiber	6%	6%
Sugars 12g		
Other Carbohydrate		
Protein 2g		
Vitamin A	25%	30%
Vitamin C	25%	25%
Calcium	4%	15%
Iron	25%	25%
Vitamin D	10%	25%
Thiamin	25%	30%
Riboflavin	25%	35%
Niacin	25%	25%
Vitamin B_6	25%	25%
Folic Acid	25%	25%
Phosphorus	6%	20%
Magnesium	4%	8%
Zinc	2%	6%
Copper	2%	2%

* Amount in Cereal. A serving of cereal plus milk provides 0.5g saturated fat, <5mg cholesterol, 240mg sodium, 270mg potassium, 30g carbohydrate (18g sugar) and 6g protein.

**Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Potassium		2,500mg	3,500mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram: Fat 9 • Carbohydrate 4 • Protein 4

INGREDIENTS: WHOLE OAT FLOUR (INCLUDES THE OAT BRAN), SUGAR, CORN SYRUP, DRIED APPLE PIECES, PARTIALLY HYDROGENATED SOYBEAN OIL, WHEAT STARCH, SALT, CINNAMON, CALCIUM CARBONATE, TRISODIUM PHOSPHATE, COLOR AND FRESHNESS PRESERVED BY SODIUM SULFITE, SULFUR DIOXIDE AND BHT.
VITAMINS AND MINERALS: VITAMIN C (SODIUM ASCORBATE), A B VITAMIN (NIACIN), IRON (A MINERAL NUTRIENT), VITAMIN A (PALMITATE), VITAMIN B_6 (PYRIDOXINE HYDROCHLORIDE) VITAMIN B_2 (RIBOFLAVIN), VITAMIN B_1 (THIAMIN MONONITRATE), A B VITAMIN (FOLIC ACID) AND VITAMIN D.

← The "% Daily Value" column shows how the cereal (or food) fits into the overall daily diet of 2,000 calories

← Choose foods that are high in protein and carbohydrates, and low in calories and fat.

← These are the good guys. Vitamins and minerals help you grow and keep your body healthy. So, choose foods that contain a high percent of vitamins and minerals.

← The ingredients tell you what the cereal (or food) is made from and are listed in descending order by weight. That is, the first ingredient listed makes up the largest part of the cereal and the last ingredient listed contributes the least amount.

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WORKSHEET 3B

NAME_____

YOU ARE WHAT YOU EAT

Try to find all the foods in your house that list wheat or flour as an ingredient. Read the nutrition labels on the back of food packages and fill in the columns below with the nutritional information. Labels may vary in nutrients, and some nutrition labels will not list all the information for each columns.

	Food Containing Wheat	Serving Size	Carbohydrate g*	Protein g	Fat g
1.	Graham cracker	2 crackers	11 g	1 g	1 g
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					

*g refers to grams

WORKSHEET 3C

NAME_____

WHEAT SCAVENGER HUNT

On the back of most food packages there is a label that lists the ingredients. Try to find all the foods in you house that have wheat or flour listed as an ingredient. Look closely. You'll be surprised at which food items contain wheat or flour. (Clue: Did you know that dry dog food is made with wheat?)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____
25. _____
26. _____
27. _____
28. _____
29. _____
30. _____

WORKSHEET 3D

NAME_____

FOODS WITH WHEAT DON'T HAVE TO BE PUZZLING

The words at the bottom of the page are hidden in the slice of bread. Can you find them?

L	A	E	R	E	C	B	V	M	G	R	A	I	N	W	X	P
E	U	L	Q	W	G	S	R	H	K	B	Z	Y	U	L	I	N
N	M	T	C	C	W	E	N	I	C	A	I	N	T	Z	B	I
R	G	P	K	A	G	F	W	D	E	O	X	K	R	W	F	E
E	B	O	Q	N	R	I	B	O	F	L	A	V	I	N	L	T
K	I	R	A	J	T	B	S	R	D	G	O	P	E	Q	Y	O
T	Y	U	A	E	P	H	O	J	E	D	D	L	N	H	W	R
G	O	E	T	N	Q	P	T	H	S	A	R	A	T	S	A	P
K	S	T	A	E	H	W	U	Z	Y	H	D	E	S	J	L	D
E	M	B	J	R	Y	K	W	H	T	D	Q	Y	A	Y	O	Q
F	O	O	D	G	U	I	D	E	P	Y	R	A	M	I	D	F
K	A	P	S	Y	H	S	R	R	D	S	J	A	I	S	Y	D
B	I	T	M	A	J	K	I	O	M	U	W	N	T	B	S	Z
R	E	B	I	F	V	W	L	E	N	D	O	S	P	E	R	M

BRAN
BREAD
CARBOHYDRATE
CEREAL
ENDOSPERM
ENERGY
FAT
FIBER
FOOD GUIDE PYRAMID
GERM
GRAIN
IRON
KERNEL
NIACIN
NUTRIENTS
PASTA
PROTEIN
RIBOFLAVIN
WHEAT

WORKSHEET 3E

NAME_____

WHAT'S IN A NAME?

Down the left side of the activity sheet is the word WHEAT. Across the top of the sheet are 5 different categories related to Idaho. For each category, find as many words as possible that start with each letter in the word WHEAT.

	FOODS made from wheat	**CITIES** in Idaho	**ANIMALS** in Idaho	**TREES** in Idaho	**COUNTIES** in Idaho
W					
H					
E					
A					
T					

LESSON 4:

"Eating For Life"

The student will:

4.1 Identify the Food Guide Pyramid. "What's a Kid to Do?" *Worksheet 4A.*

4.2 Identify foods and serving sizes in Bread & Cereal Group. "Who Said You Can't Play With Your Food?" *Worksheet 4B.*

4.3 Identify foods and serving sizes in Fruit & Vegetable Groups.

4.4 Identify foods and serving sizes in Milk, Yogurt, & Cheese Group.

4.5 Identify foods and serving sizes in Meat, Poultry, Fish, Dry Beans, Eggs, & Nuts Group.

4.6 Prepare their own daily menu after reviewing two sample menus which provide the recommended servings of the 5 food groups. "Sample Menu," *Worksheet 4C* and "My Own Menu," *Worksheet 4D.*

4.7 Become more failiar with the Food Guide Pyramid. "Crossing the Pyramid," *Worksheet 4E* and "Puzzled," *Worksheet 4F.*

Notes to teacher:

1. You may wish to make a transparency or copies of the Food Guide Pyramid and the food groups serving size sheets for your students. Different resources may list serving sizes that vary from the ones listed. This may be due to the differences in weight of the product or the number of calories needed, based on a person's activity level. Due to the fact that most people do not weigh the food before eating, approximations are used.
2. The activity on *Worksheet 4B*, "Who Said You Can't Play With Your Food?" requires students to make words out of the phrase "bread and cereal."

(continued)

LESSON 4
continued

3. "Sample Menus," *Worksheet 4C* should be copied for students' use. Menus are examples for the students to compare to their own eating habits. Be sure to tell them that they do not have to follow these menus but they should try to eat a variety of food in their diets. Allow them to design their own daily menu on "My Own Menu," *Worksheet 4D*.

4. Students need to record foods they've eaten during the day on the bottom of "Crossing the Pyramid," *Worksheet 4E*. Have students match the foods eaten with the correct food group and have them X-out the boxes in each food group.

5. There are two puzzles on *Worksheet 4F*. One contains true statements about wheat foods and the other false. Copy and cut apart puzzle pieces. When all "true statements" are put together, they form a complete puzzle. Likewise, all the "false statements" form another puzzle.

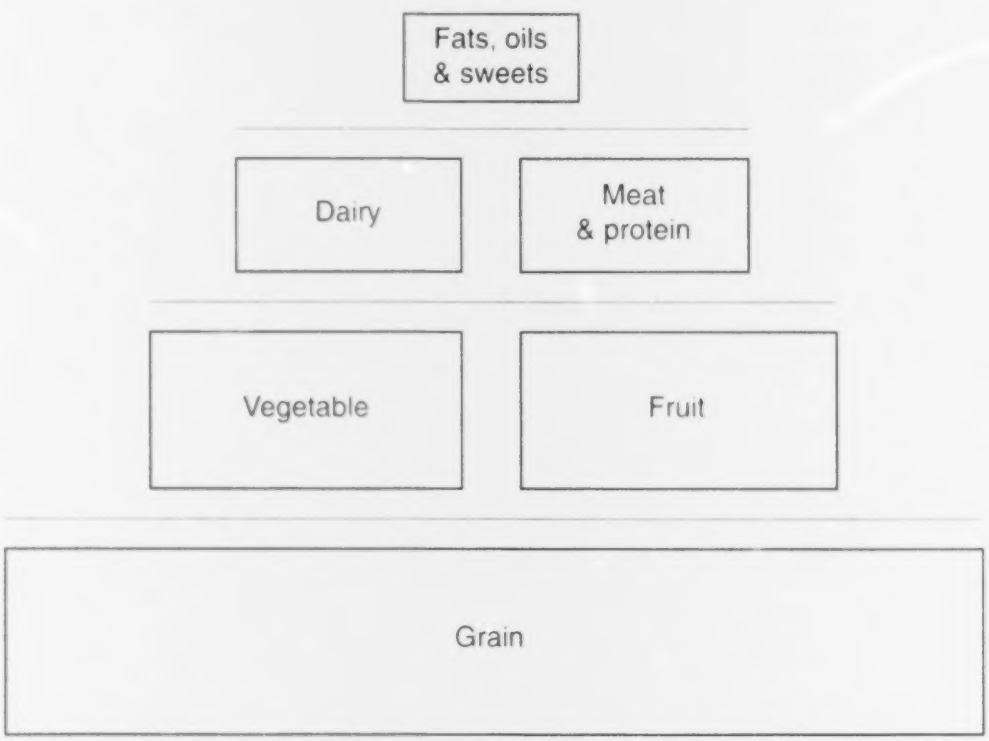
(continued)

LESSON 4
continued

Enrichment Activities:

1. Assign students a food group from the Food Guide Pyramid and have them bring in empty food containers, food wrappers or pictures of food.

   If you prefer, you can design a model of the Food Guide Pyramid by using wood planks or cardboard and coffee cans or boxes. Arrange cans or boxes in four layers between cardboard to make a pyramid shape, then have students fill the cans/boxes with the appropriate food groups.



LESSON 4.1

WHAT'S A KID TO DO?

So far, we have learned that carbohydrates, protein and fat are all calorie producing nutrients. Even though you can gain weight if you eat too much, you still have to eat to keep up your energy and to obtain your vitamins, minerals and water. Let's find out how to do it correctly!

In April of 1990 the U.S. Department of Agriculture developed the Food Guide Pyramid to help you choose what, and how much, of each food group you need to eat to stay healthy. It is important to eat a variety of food from all five groups.

Based on the Food Guide Pyramid, children should eat the following number of servings from the 5 food groups each day:

Breads and Cereals	9 servings
Vegetables	4 servings
Fruit	3 servings
Milk	3 servings
Meat	2 servings (equal to 6 ounces)

The last (sixth) group is the "fats, oils and sweets" group. Although the USDA includes these in the Pyramid, we won't discuss this group in detail. Fats, oils and sweets supply calories, but little or no vitamins and minerals.

Fats are found in all foods except fruit. Fruits, vegetables and grain products are naturally low in fat — so you can eat a lot of them. The fat found in animal products (margarine, bacon) add up fast, so, it's a good idea to choose low-fat dairy products and lean meat.

Sugars are found in all foods except vegetables and meat. Sugars may be added to foods in processing (canned fruit, soda pop) or at the table (adding sugar to your cereal). This type of sugar add lots of calories and very few vitamins and minerals. A good choice would be to eat fresh fruit and drink fruit juice, milk or water.

LESSON 4.2

BREADS & CEREAL GROUP

Most of the foods you eat during the day should come from the Bread & Cereal group. These foods are found at the base of the Pyramid and are the foundation of a healthy diet. USDA Dietary Guidelines recommend eating 9 servings a day for kids! It sounds like a lot but really it isn't. Below is a list of the foods in this group and a typical serving size.

1/2 cup	cooked rice, cereal or pasta
1/2 cup	bran cereals, flaked
1/2 cup	Shredded Wheat
1/2 cup	cooked cereals
1/2	hamburger bun or bagel or English muffin
1/2	waffle, medium
3/4 cup	most unsweetened ready-to-eat cereals
3/4 ounce	pretzels
1	slice pizza
1	rice cake
1	slice of bread
1	biscuit
1	4" pancake
1	tortilla
1-1/2 cups	puffed cereals
3	graham crackers
3 cups	popcorn, popped, no fat added
6	saltine-type crackers
8	animal crackers

LESSON 4.3

FRUIT & VEGETABLE GROUPS

The Food Guide Pyramid recommends children eat 3-4 (or more) servings a day of fruits and vegetables. Fruits and vegetables contain vitamins A and C and other important minerals. They are also naturally low in sugar and high in fiber — what more could you ask for??

The following list is broken down into fruits and vegetables and what is considered "one" serving.

FRUITS

1	apple, 2"
1/4 cup	applesauce, unsweetened
4	apricots
1/2	banana
1 cup	cantaloupe, cubes
12	cherries
1/2 cup	fruit cocktail, canned
15	grapes, small
1	nectarine, 2"
1	orange, 2-1/2"
1	peaches, 2-3/4"
1/2 cup	peaches, canned
1	pear, small
3/4 cup	pineapple, raw
2	plums, 2"
1 cup	raspberries
1-1/4 cup	strawberries
1-1/4 cup	watermelon

FRUIT JUICE

1/2 cup	apple, grapefruit, orange or pineapple juice
1/3 cup	cranberry, grape or prune juice

VEGETABLES

All sizes, except as noted, are 2 cups of any cooked vegetable or vegetable juice, 1 cup of any raw vegetable.

Asparagus
Beans
Beans, 1/4 cup baked
Beets
Broccoli
Carrots
Cauliflower
Corn
Mushrooms, cooked
Onions
Pea
Potatoes, 3 small
Potatoes, mashed
Spinach, cooked
Squash, summer
Squash, winter, 3/4 cup
Tomatoes, 1 large
Tomato/vegetable juice
Zucchini, cooked

LESSON 4.4

MILK, YOGURT & CHEESE GROUP

The foods in the group are very important because they contain calcium which helps build strong bones and healthy teeth. Kids need to have 3 or more servings per day.

1 cup	buttermilk, low-fat
1-1/2 oz.	cheese, all regular cheese
1/2 cup	cheese, cottage
2 oz.	cheese, processed
1/2 cup	ice cream, ice milk or frozen yogurt
1 tsp.	margarine
1 cup	milk
8 oz.	yogurt, plain nonfat

LESSON 4.5

MEAT, POULTRY, FISH, DRY BEANS, EGGS & NUTS GROUP

The foods in the Meat, Poultry, Fish, Dry Beans, Eggs & Nuts group supply protein, B-vitamins, iron and zinc. Protein is very important because it helps to build and repair your body as you grow. Remember to choose lean meats and eat 2 servings (6 ounces) each day.

1/2 cup	beans, cooked dry
1 oz.	beef
1	egg
1/4 cup	egg substitute
1 oz.	fish, fresh
1 oz.	lamb
1 oz.	lunch meat
2 Tbsp.	peanut butter
1 oz.	pork
1 oz.	poultry
1 oz.	sausage
1/4 cup	tuna or salmon, canned

LESSON 4.6

SAMPLE MENU

Many times we associate the word "diet" with people who are trying to lose weight and it gets a bum rap. The word actually refers to the type and amount of food and liquid that you eat and drink daily for your nourishment. If you eat, you have a diet. Many people who have health conditions need to be on special diets to reduce certain foods and help prevent further development of their disease.

On *Worksheet 4C* are sample menus showing what a young person should be eating. These menus don't mean that you have to eat these foods everyday but remember what we have discussed about the Food Guide Pyramid?? The "V" word — VARIETY — is needed in your diet so you can mix and match foods just as long as they are in the same food group.

Desserts are not included because they are generally high in fat. You can eat desserts and fats but eat them in limited amounts, and eat them at the end of your meal. That way, if you are too full you can eat them at another time.

These are only suggested menus that follow the Food Guide Pyramid. Snacks (especially healthy snacks) can be eaten any time of the day when you are hungry!!

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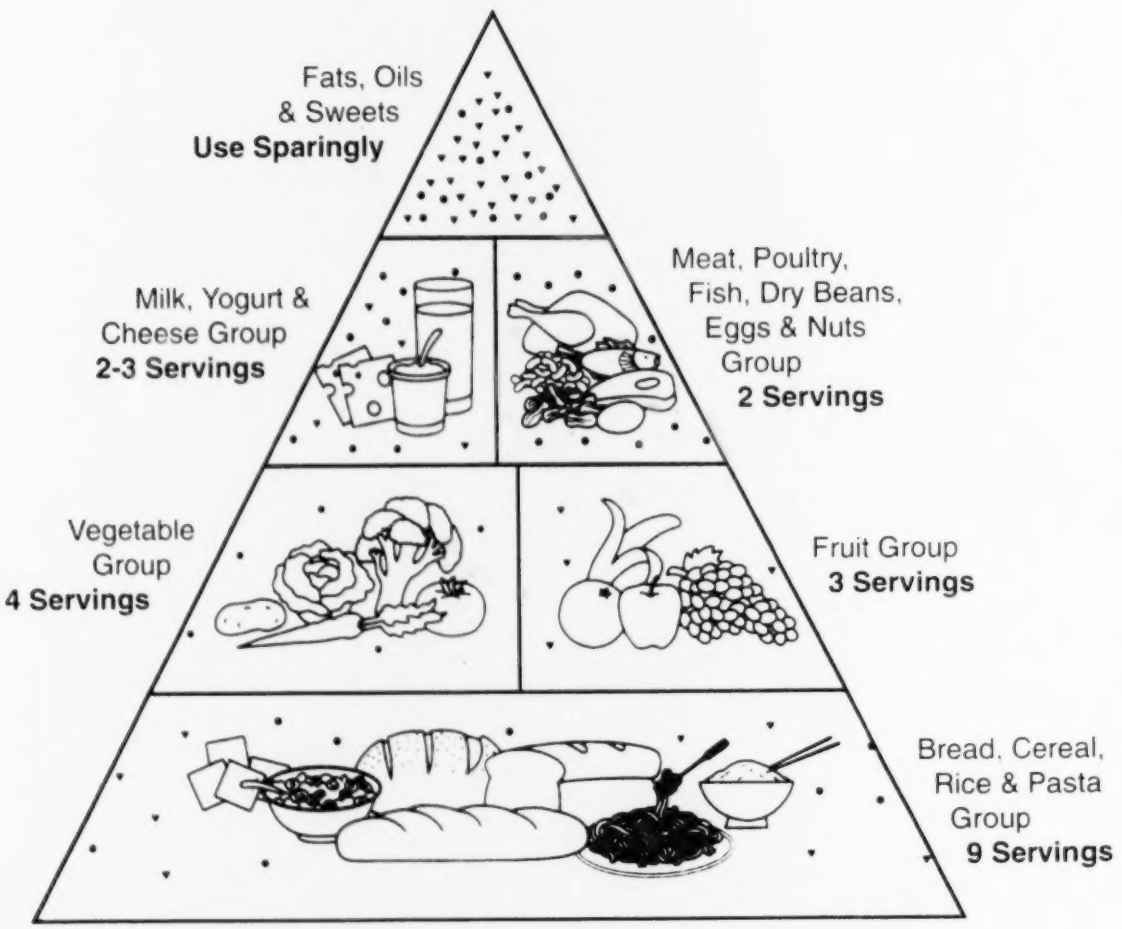
WORKSHEET 4A

NAME_____

FOOD GUIDE PYRAMID



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WORKSHEET 4B

NAME _____

WHO SAID YOU CAN'T PLAY WITH YOUR FOOD?

Try to make as many words as possible out of the words

"BREAD AND CEREAL"

1.	21.	41.
2.	22.	42.
3.	23.	43.
4.	24.	44.
5.	25.	45.
6.	26.	46.
7.	27.	47.
8.	28.	48.
9.	29.	49.
10.	30.	50.
11.	31.	51.
12.	32.	52.
13.	33.	53.
14.	34.	54.
15.	35.	55.
16.	36.	56.
17.	37.	57.
18.	38.	58.
19.	39.	59.
20.	40.	61.

WORKSHEET 4C

NAME_____

SAMPLE MENU

	FOOD GROUP	SAMPLE MENU 1	SAMPLE MENU 2
BREAKFAST	2 bread/starch	2 small waffles	1/2 bagel
	1 fruit	1 small orange	1/2 banana
	1 milk	8 oz. milk	8 oz. milk
	extra	1-2 Tbs. pancake syrup OR 1 tsp. margarine	2 tsp. jam or jelly
LUNCH	3 bread/starch	1 pita pocket (4") 6 saltine-type crackers	2 slices bread 1 ear corn on cob
	1 meat	1/4 cup tuna fish	2 oz. turkey breast
	2 vegetables	1 cup vegetable soup 1 cup chopped tomatoes & lettuce	1 carrot cut in sticks 1 cup lettuce & tomatoes
	1 fruit	1 apple (2")	2 fresh plums (2")
	1 milk	8 oz. milk	8 oz. milk
	extra	1 Tbs. mayonnaise, salad dressing, mustard or ketchup	1 Tbsp. mayonnaise, salad dressing, mustard or ketchup
NOON SNACK	1 bread/starch	1/2 bagel	2 small cookies (1-3/4")
	1 vegetable	1/2 cup sliced carrots, cucumbers or broccoli	1/2 cup tomato juice
	extra	1 Tbsp. vegetable dip	
DINNER	2 bread/starch	1 small dinner roll 1/3 cup rice	1/2 cup pasta 2 bread sticks (4"x1/2")
	1 meat	4 oz. baked chicken	4 oz. hamburger
	1 vegetable	1/2 cup cooked peas	1 cup tomato sauce
	1 milk	8 oz. milk	8 oz. milk
	extra	2 tsp. margarine	
LATE SNACK	1 bread/starch	3 cups plain popcorn	1 slice banana bread
	1 fruit	4 fresh, medium apricots	1-1/4 cup strawberries

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WORKSHEET 4D

NAME_____

MY OWN MENU

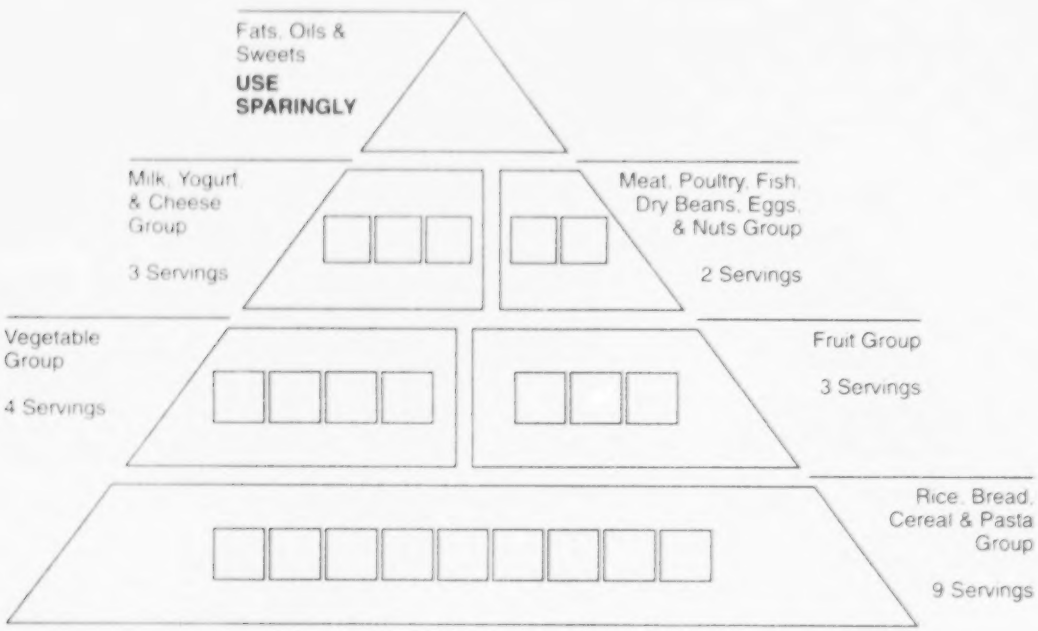
	FOOD GROUP	MENU 1	MENU 2
BREAKFAST			
LUNCH			
NOON SNACK			
DINNER			
LATE SNACK			

WORKSHEET 4E

NAME_____

CROSSING THE PYRAMID

List the different foods you have eaten today on the bottom of the page. For each serving of food, put an X in the appropriate food group box.



Foods I have eaten:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

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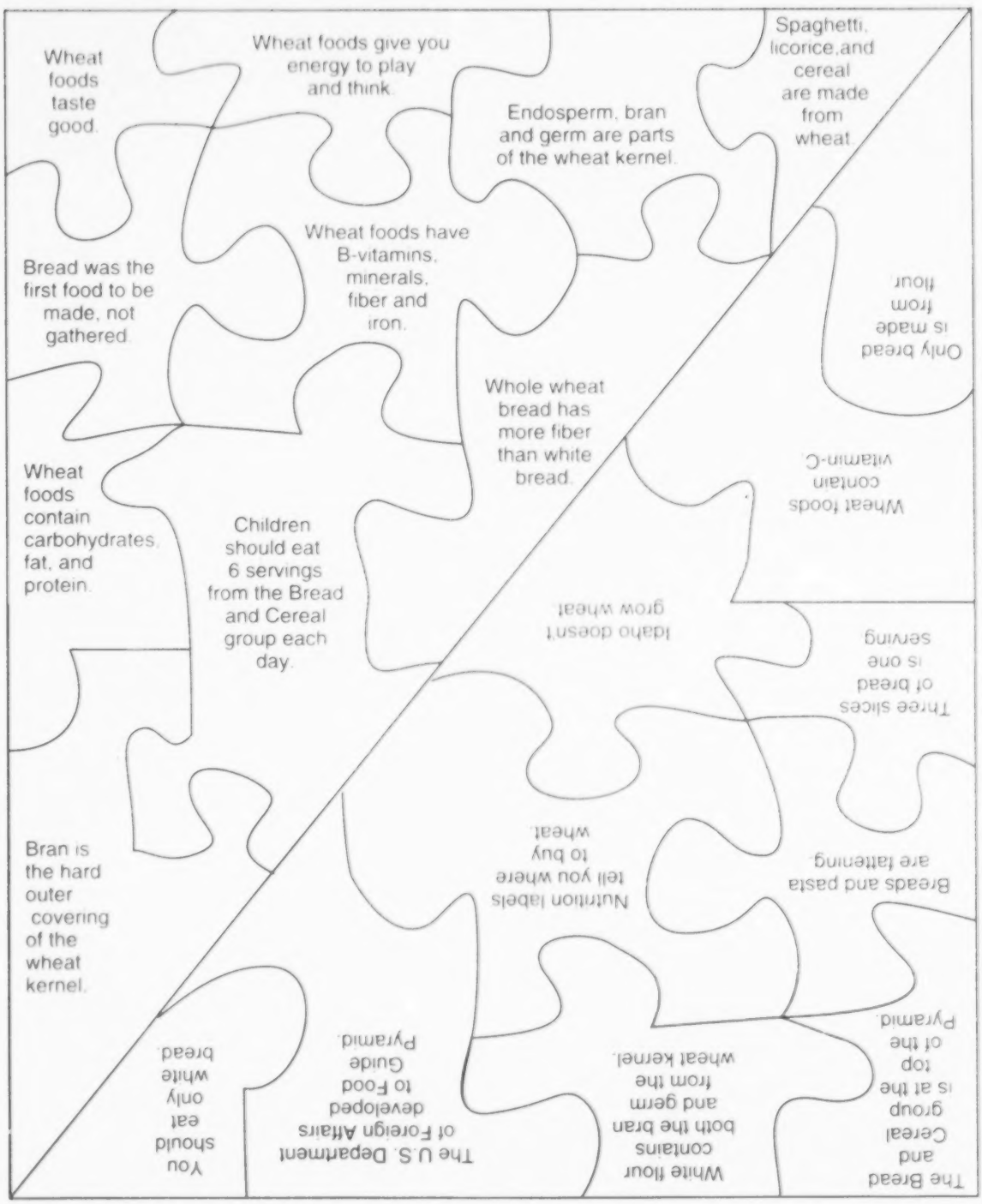
WORKSHEET 4F

PUZZLES


Wheat foods taste good.
Wheat foods give you energy to play and think.
Endosperm, bran and germ are parts of the wheat kernel.
Spaghetti, licorice, and cereal are made from wheat.
Bread was the first food to be made, not gathered.
Wheat foods have B-vitamins, minerals, fiber and iron.
Only bread is made from flour.
Whole wheat bread has more fiber than white bread.
Wheat foods contain vitamin-C.
Wheat foods contain carbohydrates, fat, and protein.
Children should eat 6 servings from the Bread and Cereal group each day.
Idaho doesn't grow wheat.
Three slices of bread is one serving.
Bran is the hard outer covering of the wheat kernel.
Nutrition labels tell you where to buy wheat.
Breads and pasta are fattening.
You should eat only white bread.
The U.S. Department of Foreign Affairs developed to Food Guide Pyramid.
White flour contains both the bran and germ from the wheat kernel.
The Bread and Cereal group is at the top of the Pyramid.

Extra Curricular Lesson:

LESSON 5:

"Cooking with Wheat"

The student will:

5.1 Read (and/or make) recipes containing wheat products.
"Easy Recipes."

5.2 Observe demonstrations about starch and list results.
"Wheat Starch."

5.3 Observe demonstrations about gluten and list results.
"Gluten Balls."

Notes to the teacher:

1. Recipes can be copied and sent home with students. Remind students to have parents help them with the stove.

2. A short explanation of starch is given in Lesson 5.2. The demonstration on this page will help the student understand that starch creates the adhesive composition that binds wheat foods. This activity requires the use of flour, Cream of Wheat, or Farina and water.

3. An explanation of gluten is included in Lesson 5.3. The best way to illustrate gluten in flour is to make gluten balls. This is time consuming, but fun. You may choose to do this visual project prior to the lesson or send it home with children to complete. It will take at least 2 hours.

4. Learn how to make a bread basket with dough.
"Food and Fun Craft Corner," *Worksheet 5A*.

   Bread baskets are time consuming. If basket is made at school you will want to have the dough pre-made and the strips pre-cut (to make it easy), or the instruction sheet can be copied and sent

continued

LESSON 5:
continued

home with the children. Encourage students to be creative: make cups, bowls, or Christmas tree decorations. You can also have the students paint their creations. Also, suggest that students make wheat recipes, such as the Banana Bread or Blueberry-Orange Squares and place them on a colored napkin in the basket they made.

Enrichment Lesson:

1. Make a bread product in school with the Idaho Wheat Commission: Bread in A Bag Program. Notification of the "Bread in a Bag" program is sent to 4th grade teachers in Idaho's elementary schools in the fall. Teachers must return the participation form within the deadline to participate. The program is free and available only to 4th grade classes. However, any extra supplies left from the program are available to the public on a first-come, first-serve basis.

LESSON 5.1

EASY RECIPES

BANANA BREAD

Equipment	Ingredients
Flour sifter	2 cups sifted all-purpose flour
Mixing bowl	1/4 tsp. salt
Measuring cups	3 tsp. baking power
Measuring spoons	1/2 cup sugar
Small bowl	1 tsp. cinnamon
3 loaf pans, 5-3/4" x 3" x 2-1/8"	1 egg
Kitchen fork	1 cup milk
Wooden spoon	1 cup mashed bananas
	no-stick cooking spray

Preheat oven to 350°F. Lightly spray loaf pans with no-stick cooking spray.

Sift flour, salt, baking powder, cinnamon and sugar into mixing bowl. In small bowl, beat egg with fork. Add milk and mashed bananas. Pour liquid ingredients into dry ingredients. Stir gently with wooden spoon until all ingredients are moist (don't over-stir).

Pour batter into loaf pans about 3/4 full. Bake 1 hour. Poke a toothpick into the bread and if it comes out clean the bread is finished. Place on a cooling rack for 5 minutes. Remove bread from pan and serve warm or allow bread to fully cool before refrigerating.

BLUEBERRY-ORANGE SQUARES

Equipment	Ingredients
2 medium bowls	2 cups pastry flour
Wooden spoon	1/2 cup granulated sugar
Measuring cups	1 Tbs. granulated sugar
Measuring spoons	1 Tbs. baking powder
Wire whisk	1 tsp. salt
Glass baking dish, 13" x 9"	1 cup frozen (do not thaw) or fresh blueberries
Knife	1 cup skim milk
	1/4 cup margarine, melted
	1 egg, large
	2 tsp. grated orange rind or orange extract
	no-stick cooking spray

Preheat oven to 425°F. Lightly spray a glass baking dish with no-stick cooking spray.

In a medium bowl mix flour, 1/2 cup sugar, baking powder and salt. Add blueberries to dry ingredients and mix until lightly coated. In another medium bowl, whisk milk, butter, egg and orange peel or extract. Stir into dry ingredients until just combined.

Spread into prepared pan. Sprinkle remaining tablespoon of sugar over the top. Bake 20 minutes. When cool cut into squares. Makes 24 servings.

LESSON 5.2

WHEAT STARCH

Starch is a compact structure found in grains. When water is added to starch and heated, the structure absorbs the water and expands. As the starch absorbs the water it becomes sticky and adheres to other starch particles to form a gel. Therefore, it is called a thickening agent. If you have ever eaten pudding, pie filling, gravy, or Cream of Wheat, you have seen starch at work.

EXPERIMENT:

MATERIALS NEEDED:

Cream of Wheat, Farina, or flour
Water
Oven or heating element
Wooden spoon

PART 1: Place 1 cup of cold water and 2 cups Cream of Wheat, Farina or flour in a clear glass bowl. Mix with a wooden spoon until water turns white then allow the flour particles to settle. Show the students how the water has turned white. This is starch.

PART 2: Using an oven or heating element, cook the Cream of Wheat or Farina according to package directions. Explain to the students that starch absorbs water as it is heated and becomes sticky, which forms the cooked cereal.

PART 3: You may also illustrate starch by pouring the Cream of Wheat or Farina into the boiling water, but DO NOT STIR. This will create large lumps. The surrounding starch granules stick together and prevent the center granules from absorbing the water. By cutting the lumps in half, you can see the individual granules.

LESSON 5.3

GLUTEN BALLS

Have you ever wondered why bread products have so many holes? When flour is mixed with water the protein in the wheat causes the mixture to expand and form a sticky, elastic structure called a gluten complex. This gluten complex stretches when mixed with a leavening agent such as baking soda, baking powder, cream of tarter, or yeast. These leavening agents produce a gas that expands the gluten strands to produce the structure of the baked product.

Different types of flour will create slightly different gluten structures because of the amount of protein found in the flour. Flours made from hard wheat such as bread or all-purpose flour have a higher protein content and will form a stronger gluten complex. This is the reason that bread or all-purpose flours are used when making yeast breads. Yeast produces a gas which will expand the gluten in the flour and produce a high volume loaf of bread and create the holes that you see in bread.

In the process of making gluten balls, starch and other particles are removed from flour by washing a dough ball with cold water. Once all of the starch is washed out, the remaining substance is a stringy material called gluten. This can be formed into a ball and baked in the oven. The gluten strands are expanded by steam and stiffened by the heat. Depending on the flour, the ball can expand greatly. Once the ball has finished cooking and is cut open, the structure can be seen.

In the following activity, students can make gluten balls to see the difference in each type of flour. Gluten can be separated from flour by adding water to form a stiff dough and then kneading in water to wash away the other components, largely starch. The wet, sticky, gluten will expand greatly when baked to form a light, porous ball. Baking the gluten illustrates how much the ball will expand with steam and that the heat will form the structure of the baked product.

HOW TO MAKE GLUTEN BALLS:

1. Measure 1 cup each of:
   a. Cake flour
   b. All-purpose flour
   c. Bread or whole wheat flour
2. Add 4-6 tablespoons water to each of the flours and mix with a fork to make a stiff dough.
3. Let the dough rest for 5 minutes to allow the flour to hydrate (soak up the water).
4. Knead each dough ball for 10 minutes until it is smooth and elastic. If the dough is not smooth and elastic, make another dough with the same amount of flour, adjusting the amount of water.
5. Place each dough in a bowl of cold water and let it soak for 5 minutes.
6. After soaking, place a double piece of cheesecloth on a wire sieve or in an embroidery hoop. Wash starch from the dough by squeezing it gently under a stream of tap water or in a bowl filled with tap water, keeping the cloth under, but not around, the dough. Add to the dough any particles that collect on the cloth. If a bowl is used, change the water several times. The white color of the water shows that starch is being removed.
7. Preheat oven 450°F.
8. Continue kneading under cold running water until all the starch has been removed. After about 10 minutes, squeeze 1 or 2 drops of wash water from the dough into a container of clear water. If the water remains clear, the starch has been completely extracted. If it is cloudy, continue washing until water is clear.
9. Squeeze out as much water as possible.
10. Shape the strand into a ball. Measure height and width with a ruler.
11. Place each gluten ball on a greased cookie sheet far enough apart to allow room for expansion.
12. Bake 10 minutes at 450°F. Lower heat to 300°F for additional 30 minutes.
13. Measure baked gluten balls and measure height.
14. Observe surface appearance. Cut in half. Observe interior the appearance and texture.

NOTE: If desired, after STEP 6, the gluten balls can be divided into small pieces and children can knead and work the balls to form them into a bubble gum-like substance.

	All-Purpose Flour		Pastry Flour		Whole Wheat Flour	
	width	height	width	height	width	height
Before cooking	6"	4"	4-1/2"	2-1/2"	6"	3"
After cooking	11"	10-1/2"	8-1/2"	7"	10"	9-1/2"

WORKSHEET 5A

Food & Fun
CRAFT CORNER

Reprinted with permission from "What to Eat? And Other Questions Kids Ask About Foods," USDA, 1979

Bread is the basis of meals around the world. But did you ever think of the other uses to which it can be put? For one thing, it can be used to make a kind of clay.

Bread dough has been used for sculpturing by people for centuries. The Incas, who lived in parts of South America, used figures made of bread dough for their festivals and celebrations.

If your parents bake their own bread, ask for some of their dough. The frozen dough that can be bought at a supermarket also works well.

Or — try making your own. It won't taste good to eat, but it's fine for sculpturing. Remember, don't use or operate the stove without permission and help.

DOUGH THAT'S NOT FOR SPENDING OR EATING

To make bread dough, you need:

- 4 cups flour
- 1 cup salt
- 1 cup cool water

Here's What You Do:

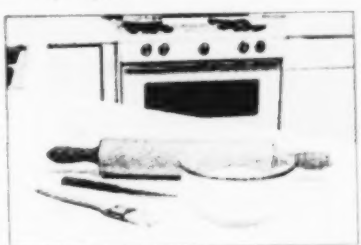
1. Mix the flour and salt together.
2. Slowly add the water and mix.

3. Knead the dough – with clean hands for 5 or 10 minutes.

Now try making a basket from the dough-clay.

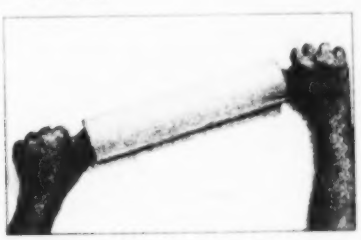
Here's What You Need:

- Oven for baking
- Dough
- Metal or glass bowl that can go in the oven
- 1 small brush
- 1/4 cup milk
- Small amount of shortening
- Table knife
- Rolling pin

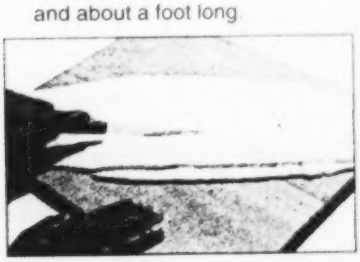


Here's What You Do:

1. Grease the outside of the bowl with the shortening. Be sure the bowl is well-covered. Turn the bowl upside down on a kitchen counter.



2. Roll some of the dough with a rolling pin until it is 1/2-inch thick and about a foot long.



3. Cut the dough into strips about 3/4-inch wide.

4. Put a layer of strips around the bowl, 1/2 inch apart. Put a layer of strips over the bowl.
5. Twist one long rope of the dough to make a lip around the bottom of the bread-dough basket. This will be the top rim of the finished basket.

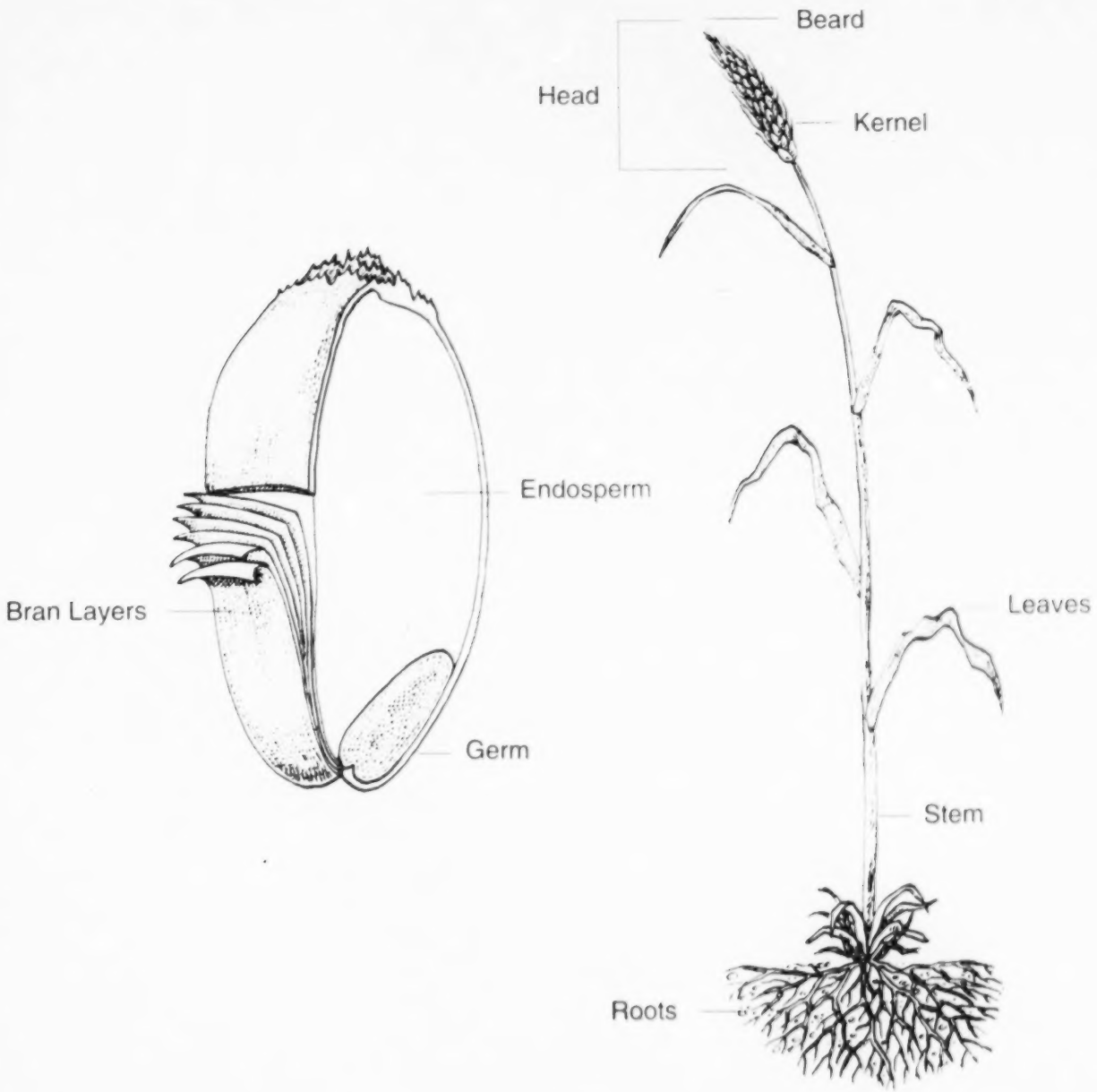
6. Brush the entire basket with the milk. That makes it a nice color once it is baked.
7. Put it in a n oven that has been preheated to 350 F. Let it bake for about 1/2 to 1 hour — until it is well-browned.
8. Remove the sculpture from the oven. Let it cool before you try to remove it from the bowl.

Try making other forms, too. Try making a car, or a little house, or an initial.

ANSWER KEY – WORKSHEET 1A

THE WHEAT PLANT AND WHEAT KERNEL

(also known as the wheat berry)



ANSWER KEY – WORKSHEET 1B

WHICH PART OF THE KERNEL?

Fill in the blanks with the correct answer. Choose the answers from these three words:

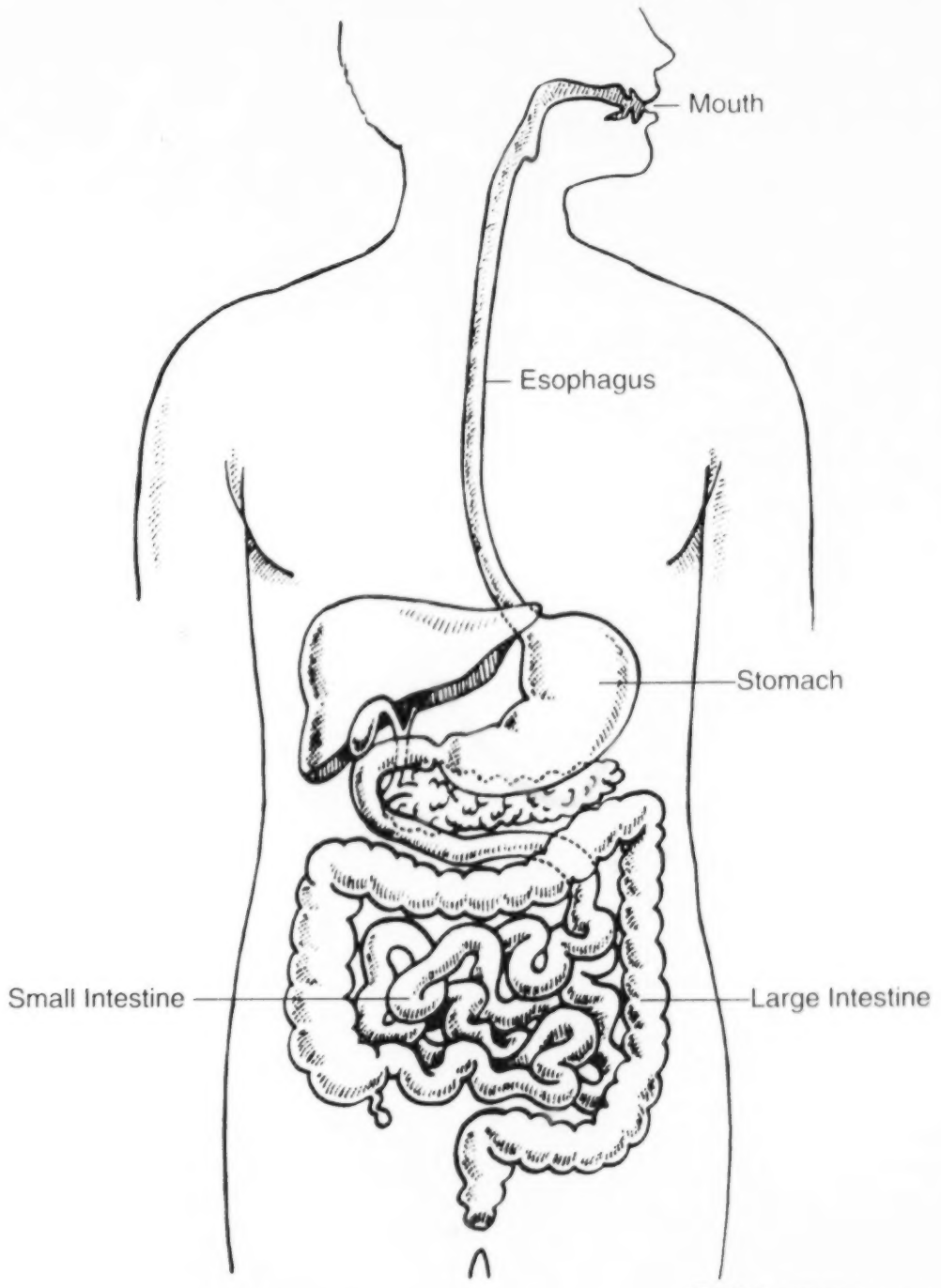
Bran Endosperm Germ

1.	ENDOSPERM	I am the largest part of the kernel.
2.	BRAN	I am the hard outer covering of the kernel.
3.	ENDOSPERM	We are used to make wheat flour.
	BRAN	
	GERM	
4.	GERM	I only make up 2-1/2% of the kernel.
5.	ENDOSPERM	I am used to make white flour.
6.	BRAN	I am made of many thin layers.
7.	ENDOSPERM	I make up 83% of the kernel.
8.	GERM	I grow into a new plant.
9.	BRAN	I am 14-1/2% of the kernel.
10.	GERM	I am the smallest part of the kernel.
11.	ENDOSPERM	I nourish the young plant when it starts to grow.
12.	BRAN	I am the part you touch, when you hold the kernel of wheat.

Adapted from *Nebraska's Ag in the Classroom Program*

WORKSHEET 2A – ANSWER

THE DIGESTIVE SYSTEM



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ANSWER KEY – WORKSHEET 3D

FOODS WITH WHEAT DON'T HAVE TO BE PUZZLING

L	A	E	R	E	C	B	V	M	G	R	A	I	N	W	X	P
E	U	L	Q	W	G	S	R	H	K	B	Z	Y	U	L	I	N
N	M	T	C	C	W	E	N	I	C	A	I	N	T	Z	B	I
R	G	P	K	A	G	F	W	D	E	O	X	K	R	W	F	E
E	B	O	Q	N	R	I	B	O	F	L	A	V	I	N	L	T
K	I	R	A	J	T	B	S	R	D	G	O	P	E	Q	Y	O
T	Y	U	A	E	P	H	O	J	E	D	D	L	N	H	W	R
G	O	E	T	N	Q	P	T	H	S	A	R	A	T	S	A	P
K	S	T	A	E	H	W	U	Z	Y	H	D	E	S	J	L	D
E	M	B	J	R	Y	K	W	H	T	D	Q	Y	A	Y	O	Q
F	O	O	D	G	U	I	D	E	P	Y	R	A	M	I	D	F
K	A	P	S	Y	H	S	R	R	D	S	J	A	I	S	Y	D
B	I	T	M	A	J	K	I	O	M	U	W	N	T	B	S	Z
R	E	B	I	F	V	W	L	E	N	D	O	S	P	E	R	M

BRAN
BREAD
CARBOHYDRATE
CEREAL
ENDOSPERM
ENERGY
FAT
FIBER
FOOD GUIDE PYRAMID
GERM
GRAIN
IRON
KERNEL
NIACIN
NUTRIENTS
PASTA
PROTEIN
RIBOFLAVIN
WHEAT

ANSWER KEY – WORKSHEET 4B

WHO SAID YOU CAN'T PLAY WITH YOUR FOOD?

ACE	RUN	BED
BEAD	DREAD	BEAR
CAR	ABLE	BEER
CAN	ADD	BLED
LED	READABLE	BREAD
LEAD	LEARN	BREED
BAD	DEAR	DEED
RAD	DEER	SAND
RED	BLEND	CAB
RAT	BEE	CARD
EASE	BEAN	CABLE
READ	BEEN	DARE
REEL	DAD	LADDER
REAL	EAR	LAD
ARE	EARL	LEADER

RESOURCES:

About Wheat. Wheat Foods Council

Wheat For Kids: Everything you ever wanted to know about wheat. Idaho Wheat Commission

Wheat Facts. The National Association of Wheat Growers

Nature's Best...Wheat Foods. Wheat Foods Council

Idaho Wheat Commission: Bread in A Bag Program

What's to Eat? And Other Questions Kids Ask About Food. United States Department of Agriculture

The Food Guide Pyramid. United States Department of Agriculture

Pathways. A Success Guide for a Healthy Life. D. Kemper, J. Guiffre', G. Brabinski

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